Passive Wireless Sensor System for Structural Health Monitoring, Phase I

Completed Technology Project (2014 - 2014)

Project Introduction

Albido proposes to develop a Passive Wireless Sensor System for Structural Health Monitoring capable of measuring high-bandwidth temperature and strain of space and aerospace vehicle components operating in extreme environments. The proposed system uses a network of true passive Surface Acoustic Wave (SAW) temperature/strain sensors that can be interrogated wirelessly from a distance of several meters. SAW sensors are lightweight, passive (battery-less), simple, reliable, scalable, sensitive, do not disturb the operating environment, can be permanently placed on the critical components, allow quick and inexpensive acquisition of data to diagnose structure performance or failures, and transmit the relevant data to a remote data processing center wirelessly. A low cost software radio approach will be developed to overcome a strategic bottleneck in SAW sensor system development. In Phase I Albido will demonstrate the proof-of-concept of the proposed sensor and the transmission capability in an adequate laboratory environment (TRL 3). Based on a successful completion of Phase I, we will develop a product prototype in Phase II that will be validated in a relevant environment by comparison testing against conventional instrumentation on a test article indicated by NASA. At the end of Phase II, the sensor system will be at TRL 6.

Primary U.S. Work Locations and Key Partners

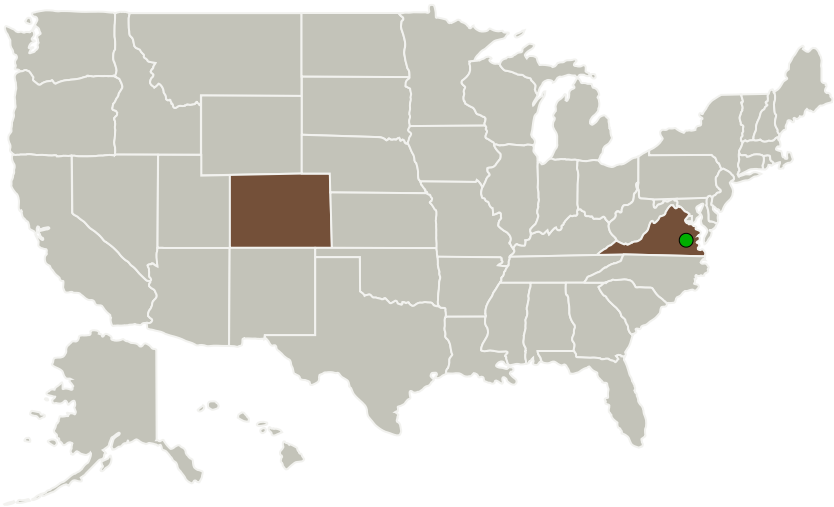

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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Albido Corporation	Lead Organization	Industry	Colorado Springs, Colorado
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Colorado	Virginia

Project Transitions

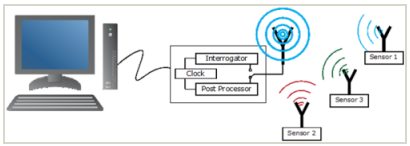
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140528)*

Images



Briefing Chart
Passive Wireless Sensor System for Structural Health Monitoring, Phase I
(https://techport.nasa.gov/image/131376)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Albido Corporation

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

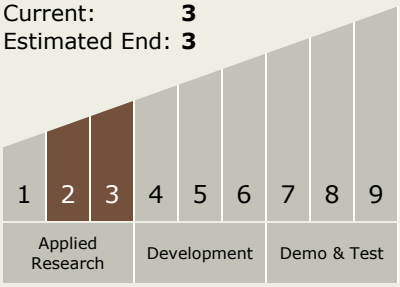
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Viorel Olariu

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.3 Mechanical Systems
    - TX12.3.4 Reliability, Life Assessment, and Health Monitoring

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System